UNITED STATES PATENT AND TRADEMARK OFFICE

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| 10/724,314 | 11/26/2003 | Bharath SV Kumar | 140275-1 | 2929 |

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GENERAL ELECTRIC COMPANY
GLOBAL RESEARCH
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| EXAMINER |
|---|
| MOTSINGER, SEAN T |

| ART UNIT | PAPER NUMBER |
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| 2624 | |

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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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| | Application No. | Applicant(s) |
|---|---|---|
| **Office Action Summary** | 10/724,314 | KUMAR ET AL. |
| | Examiner | Art Unit | |
| | SEAN MOTSINGER | 2624 | |

*-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --*

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

1) ☒ Responsive to communication(s) filed on <u>7/16/2008</u>.

2a) ☒ This action is **FINAL**.          2b) ☐ This action is non-final.

3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

4) ☒ Claim(s) <u>1-3,5,8,9,12 and 15-22</u> is/are pending in the application.

    4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5) ☐ Claim(s) _____ is/are allowed.

6) ☒ Claim(s) <u>1-3,5,8,9,12 and 15</u> is/are rejected.

7) ☐ Claim(s) _____ is/are objected to.

8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

**Application Papers**

9) ☐ The specification is objected to by the Examiner.

10) ☒ The drawing(s) filed on <u>26, November 2003</u> is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a) ☐ All   b) ☐ Some *  c) ☐ None of:

      1. ☐ Certified copies of the priority documents have been received.

      2. ☐ Certified copies of the priority documents have been received in Application No. _____.

      3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

1) ☒ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☐ Information Disclosure Statement(s) (PTO/SB/08)
    Paper No(s)/Mail Date _____.

4) ☐ Interview Summary (PTO-413)
    Paper No(s)/Mail Date. _____.

5) ☐ Notice of Informal Patent Application

6) ☐ Other: _____.

### *Response to Applicants Arguments*

Applicants arguments /amendments filed on 7/16/2008 have been entered and made of

record and are considered below.


Applicants arguments/amendments with respect to 35 U.S.C. 103 have been fully

considered but are moot due to new grounds of rejection discussed below.


### *Rejections Under 35 U.S.C. 112*

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly
claiming the subject matter which the applicant regards as his invention.

Claim 1-3,8-9,12,15-22 rejected under 35 U.S.C. 112, second paragraph, as

being indefinite for failing to particularly point out and distinctly claim the subject matter

which applicant regards as the invention. These claims contain both slices and cross

sectional images however slices and cross sectional images are both the same thing.

(i.e. a slice is a cross sectional image of the volume). Further more it the claims makes

it unclear what a "thick slab representation" is. Is a thick slab the same as a subset of

data or is a thick slab the lowest sub band of one of the subsets which have been

completely axially decomposed? What is the difference between a thick slab and the

set of images?. The claim describes thick slabs in multiple ways "each subset of data

representing a thick slab comprising a common number of adjacent images slices" and

"such that at least one thick slab represent an average of all composite slices from

forming the at least one thick slab". Does a thick slab comprise image slices or

comprise the lowest sub band of a wavelet transformation of the image slices? The

claim language should be modified to clarify the claims.


## *Rejections Under 35 U.S.C. 103*

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or
> described as set forth in section 102 of this title, if the differences between the subject
> matter sought to be patented and the prior art are such that the subject matter as a
> whole would have been obvious at the time the invention was made to a person
> having ordinary skill in the art to which said subject matter pertains.  Patentability
> shall not be negatived by the manner in which the invention was made.


Claims 1-2, 5, 9, 12, 15, and 22 are rejected under 35 U.S.C. 103(a) as being

unpatentable over Pesquet-Popescu US 6,898,324 in view of Pearlman et al US

6,674,911.


Re claim 1 Popescu discloses  a method of processing image data comprising:

receiving data indicative of a group of consecutive cross sectional images (video

sequence paragraph 24),  of a video (paragraph 24), each of the cross sectional images

being perpendicular to a z-axis (temporal axis paragraph 24), the group of consecutive

cross sectional images having a first axial resolution in a z-axis direction (temporal

resolution paragraph 25) and having a first spatial resolution in x-axis and y-axis

directions orthogonal to the z-axis (figure 2 and figure 1 note the spatial axes of the

frame are orthogonal to the temporal axis); dividing the data into a plurality of subsets of

data (Group of frames paragraph 24), each subset of data representing a thick slab

(note a group of frames represents a slab paragraph 24) comprising a desired number

of adjacent image slices ( frames paragraph 24) with corresponding cross sectional

images. Performing a wavelet transform on (sub band decomposition paragraph 24 )

the at least on thick slab representation (group of frames paragraph 24) in the z-axis

direction (temporal direction) to generate an axially transformed representation of the at

least one thick slab (temporally decomposition pargraph 29), having a second axial

resolution lower than the first axial resolution ( varaiety of temporal resolutions

paragraph 24); such that the at least one thick slab represents an average of all

composite slices forming the at least one thick slab (see figure 1 note the LLL sub band

created by the wavelet decomposition (i.e. the lowest temporal resolution paragraph 25)

will represents an average of all composite slices forming the at least one thick slab;

performing a wavelet transform (paragraph 29) on the axially transformed

representation of a  thick slab in x-axis and y-axis directions (paragraph 29) to generate

a spatially transformed representation of the axially transformed representation of the at

least one thick slab (spatio-temporal tree paragraph 29), the spatially transformed

representation having a second spatial resolution lower than the first spatial resolution

(paragraph 29 note that wavelet transform provides reduced resolution representation

also see figure 2). The 3d sequence of cross sectional images of Popescu are of a

video sequence and not of an image volume.  Pearlman et al discloses that 3-d sub

band coding (i.e. wavelet) for video are also useful in compressing volume images

(column 4 lines 25-30 and column 3 lines 40-67)

Re claim 2 Popescu further discloses generating reconstruction data (reconstruction

paragraph 25) to allow reconstruction of the group from the axially transformed

representation (paragraph 25);.

Re claim 5 Popescu further discloses performing entropy encoding of the axially

transformed representation (paragraph 29).

Re claim 9 Popescu further discloses performing entropy encoding of the spatially

transformed representation (paragraph 29).

Re claim 12 Popescu discloses a method of processing image data comprising:

receiving data indicative of a group of consecutive cross sectional images (video

sequence paragraph 24), of a video (paragraph 24), each of the cross sectional images

being perpendicular to a z-axis (temporal axis paragraph 24); dividing the data into a

plurality of subsets of data (Group of frames paragraph 24), each subset of data

representing a thick slab (note a group of frames represents a slab paragraph 24)

comprising a desired number of adjacent image slices ( frames paragraph 24) with

corresponding cross sectional images; performing a wavelet transform on (sub band

decomposition paragraph 24 ) the at least on thick slab representation (group of frames

paragraph 24) in the z-axis direction (temporal direction) to generate a first transformed

representation of the at least one thick slab (temporally decomposition pargraph 29),

such that the at least one thick slab represents an average of all composite slices

forming the at least one thick slab (see figure 1 note the LLL sub band created by the

wavelet decomposition (i.e. the lowest temporal resolution paragraph 25) will represents

an average of all composite slices forming the at least one thick slab; performing a

wavelet transform (paragraph 29) on the first transformed representation of a  thick slab

in x-axis and y-axis directions (paragraph 29) orthogonal to the z axis dirction  to

generate a spatially transformed representation of the first transformed representation

of the at least one thick slab (spatio-temporal tree paragraph 29), the spatially

transformed representation having a second spatial resolution lower than the first spatial

resolution  (paragraph 29 note that wavelet transform provides reduced resolution

representation also see figure 2). The 3d sequence of cross sectional images of

Popescu are of a video sequence and not of an image volume.  Pearlman et al

discloses that 3-d sub band coding (i.e. wavelet) for video are also useful in

compressing volume images (column 4 lines 25-30 and column 3 lines 40-67)


Re claim 15 Popescu further discloses performing entropy encoding (Paragraph 29 ) of

at least one of the group consisting of the first transformed representation and the

second transformed representation.

Re claim 22, Claim 22 is a computer processor configured to perform the method of

claim 1. Popesque further discloses performing his method on a computer ( see

paragraph 004).  Therefore claim 22 is likewise rejected see rejection of claim 1


Claim 3, and 8  are rejected under 35 U.S.C. 103(a) as being unpatentable over

Popescu and Perlman  in view of Dekel US 2003/0005140.


Re claim 3 Popesque further discloses providing the axially transformed representation

to a viewer (pargraph 25) and thick slabs (spatio-temporal tree paragraph 29).  Dekel

discloses progressively providing the reconstruction data (ROI data paragraph 12) to

allow reconstruction of the image at the first resolution (lossless quality paragraph 12

and 13) based on the axially transformed representation. The motivation to combine

Dekel is to do "lossless progressive streaming of 3-d images over the internet of speed

and quality unknown in the prior art" see paragraph 12. Therefore it would be obvious to

combine Popescu and Perlman with Dekel to reach the aforementioned advantage.


Re claim 8 Popescue discloses providing the spatially transformed representation to a

viewer  and providing information to allow reconstruction of the at least one thick slab

the spatially transformed representation (paragraph 25).  Dekel discloses providing

image data progressively (see paragraph 12). The motivation to combine is to provide

progressive streaming see paragraph 12 .Therefore it would be obvious to combine

Popescu and Perlman with Dekel to reach the aforementioned advantage.

Claims 18 is rejected under 35 U.S.C. 103(a) as being unpatentable over  Popescu and

Perlman  in view of Li US 6,567,081.

Re claim 18 Popescue and Perlman discloses all of the elements of claim 12  Li

discloses further comprising encoding information in a data stream comprising

information for progressively (column 17 lines 5-10)  reconstructing the second

transformed representation (the horizontal and vertical reconstruction column 19 lines

20-35), followed by encoding information for progressively reconstructing the first

transformed representation (column reconstruction lines 30-35). The motivation to

combine is to provide progressive reconstruction. (See column 17 lines 5-10).

Claims 20-21 is rejected under 35 U.S.C. 103(a) as being unpatentable over  Popescu

Perlman and Li  in view of Dekel US 2003/0005140.

Re claim 20 Popescu Perlman and Li disclose all of the elements of claim 18 Dekel

discloses progressively extracting at least a portion of the information (data blocks

paragraph 237) from the data stream according to a desired level of viewing detail

(resolution paragraph 237) of the three dimensional volume. The motivation to combine

Dekel is to do "lossless progressive streaming of 3-d images over the internet of speed

and quality unknown in the prior art" see paragraph 12. Therefore it would be obvious to combine Popescu Perlman and Li with Dekel to reach the aforementioned advantage.


Re claim 21 Li discloses constructing the second transformed representation (the horizontal and vertical reconstruction column 19 lines 20-35), then reconstructing the first transformed representation (column reconstruction lines 30-35).

Dekel discloses to achieve a desired level of viewing detail (resolution paragraph 237) of the three dimensional volume. The motivation to combine Dekel is to do "lossless progressive streaming of 3-d images over the internet of speed and quality unknown in the prior art" see paragraph 12. Therefore it would be obvious to combine Li with Dekel to reach the aforementioned advantage.


Claim 16, 17 rejected under 35 U.S.C. 103(a) as being unpatentable over Popescu and Perlman in view of examiners official notice.


Re claim 16 Popescu and Perlman discloses all the elements of claim 12. Huffman coding is a notoriously well known method of entropy encoding. One of ordinary skill in the art would be capable of using Huffman encoding and the results would be predictable. Therefore one of Therefore it would have been obvious to one of ordinary skill in the art to combine Popescu and Perlman with Huffman encoding.


Re claim 17 The examiner is taking official notice that it is notoriously well know to use a Huffman look up table when doing Huffman encoding.. One of ordinary skill in the art

would be capable of using Huffman lookup table and the results would be predictable.

Therefore one of Therefore it would have been obvious to one of ordinary skill in the art

to combine Popescu and Perlman with Huffman look up table.

Claim 19 is rejected under 35 U.S.C. 103(a) as being unpatentable over Popescu

Perlman and Li in view of examiners official notice.

Re claim 19 The examiner is taking official notice that it is notoriously well know to use a

Huffman look up table when doing Huffman decoding. One of ordinary skill in the art

would be capable of using Huffman lookup table and Huffman encoding and the results

would be predictable. Therefore one of Therefore it would have been obvious to one of

ordinary skill in the art to combine Popescu Perlman and Li with Huffman look up table.

### Conclusion

**THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time

policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE

MONTHS from the mailing date of this action. In the event a first reply is filed within

TWO MONTHS of the mailing date of this final action and the advisory action is not

mailed until after the end of the THREE-MONTH shortened statutory period, then the

shortened statutory period will expire on the date the advisory action is mailed, and any

extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of

the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to SEAN MOTSINGER whose telephone number is (571)270-1237. The examiner can normally be reached on 9-5 M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jingge Wu can be reached on (571)272-7429. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Jingge Wu/
Supervisory Patent Examiner, Art Unit 2624

Motsinger
11/4/2008